REMARKS

The Examiner is thanked for the courtesy extended to counsel for the inventor during the telephone discussion of August 18, 2008. A Request for Continued Examination ("RCE") is submitted herewith in order for this amendment and reply to be entered and considered. As a result of the telephone discussion, claims 11 & 12 have been canceled, the remaining pending claims 1-10 and 13 amended in accordance with suggestions made by the Examiner, and new dependent claims 14-19 added to more concisely and distinctly recite the subject matter that the applicant regards as the invention. For example, the expression "adapted to" has been replaced and "said" has been used where there is antecedent basis for recitation of an element. It is respectfully submitted that the pending claims are allowable for reasons of record and as set forth herein.

Claim Rejections – 35 USC §112

Claim 11 was rejected under 35 USC §112. Since claim 11 has been canceled, it is respectfully submitted that this rejection is moot.

Claim Rejections – 35 USC §103

Prior pending claims 1-10 were rejected under 35 USC §103 as being unpatentable over Thill (U.S. Patent 4,245,597) in view of Holtzapple (U.S. Patent Publication 2002/0014069 A1). Although "Takahashi" is referred to in the first sentence of the explanation for this rejection on page 3 of the Office Action, the Examiner confirmed during the phone discussion of August 18, 2008 that this was a mistake and that the name "Thill" should be used instead. Prior pending claim 13 was rejected under 35 USC §103 as being unpatentable over Thill in view of Holtzapple et al. and further in view of Sauder (U.S. Patent 3,724,427). Both Holtzapple and Sauder were cited in the prior office action and applicant's prior remarks with respect to Holtzapple and Sauder are incorporated herein. Withdrawal of the present rejections based upon Thill in combination with Holtzapple and Sauder is respectfully requested in view of arguments of record and presented herewith.

Before addressing the rejections under 35 USC §103, it is respectfully noted that prior pending claims 11 and 12 were deemed to be allowable in the outstanding Office Action, provided amendments were made to overcome rejections under 35 USC §112. During the telephone discussion of August 18, 2008, the use of the term "reservoir" in place of "radiator" was discussed; counsel for applicant submitted that claims 11 and 12 would be allowable if the term radiator was replaced with reservoir, subject to overcoming the rejections under 35 USC §112. The Examiner advised that applicant must provide support from the present specification for replacement of radiator 414 in Figure 1 with a reservoir. Therefore, attention is respectfully drawn to applicant's specification at page 5, lines 7-8 (paragraph [0028] of the published specification, emphasis added):

> The radiator is coupled to the compressor to receive the pressurized air and adapted to cool said pressurized air and to function as a reservoir therefor.

Attention is also drawn to page 16, lines 4-5 (last sentence of paragraph [0140] of the published specification, emphasis added):

> Importantly, the radiator 414 also functions as a reservoir of cooled pressurized air.

Thus, the written description of the embodiment illustrated in Figures 1-20 clearly states that an important function of radiator 414 is as a reservoir for pressurized air from the compressor. Further, the written description of a second embodiment illustrated in Figures 21-26 includes reservoir 414A in place of radiator 414. Additional support for replacing radiator with reservoir is provided on page 23, lines 2-3, of applicant's specification (paragraph [0161] of the published specification, emphasis added):

> A second preferred embodiment of an engine according to the present invention is illustrated in FIGS. 21-26. Components of this engine which correspond to those of the first preferred embodiment are provided with identical reference numerals. As will be evident to persons of ordinary skill in the art, this engine is generally similar to that of the first preferred embodiment, and thus, a detailed description of its components and operation is neither needed nor

provided herein. Rather, for simplicity, only the differences in structure and operation are herein set out.

Therefore, applicant's specification supports claims that recite a reservoir in place of a radiator.

THILL

With reference to the rejections under 35 USC §103 based on Thill in combination with Holtzapple and/or Sauder, the Office Action asserts that Thill teaches, among other things:

(i) a compressor 8,9 adapted to receive power and, upon receiving power, to: periodically define a chamber; fill the chamber with ambient air; and carry out a pressurization process wherein the chamber volume is decreased to produce pressurized air;
(ii) a positive displacement air motor 10 adapted to be driven by the primary exhaust products to produce power and secondary exhaust products; and
(iii) an arrangement wherein the pressure of the primary exhaust products driving the air motor 10 is at substantially constant level at steady state conditions.

In view of assertions i-iii, the Office Action further asserts that:

(iv) it would be obvious to one having ordinary skill in the art to have utilized a reservoir and a tubular combuster as taught by Holtzapple, to improve the efficiency of the Thill device.

Applicant respectfully submits that the foregoing assertions are not correct for the following reasons *inter alia*. With regard to assertion i, structure 8, 9 is not a compressor which receives ambient air as claimed. Structure 8 is indicated by Thill, at column 4, lines 18-20, to be a *transfer* unit which *receives compressed air from a compressor (not shown)*. Structure 9 is a booster but does not receive ambient air and also does not clearly periodically define a chamber and carry out a pressurization process wherein the chamber volume is decreased; rather, structure 9 receives *compressed* air from the transfer unit, and, as specified in column 6, lines 64-65, structure 9 can be of positive or non-positive displacement (a non-positive displacement compressor is a compressor that does not periodically define a chamber that decreases in volume). Furthermore, the relatively cool high pressure air from structure 9 is not intended to be fed into the combustor, but to bypass it and provide cool high pressure air as a cooling and

sealing medium to the galleries or passages 23 and 24 (see column 5, lines 44-47 and column 7, lines 8-10).

With regard to assertion ii, structure 10 is not a positive displacement air motor adapted to be *driven* by primary exhaust products as claimed. Rather, as indicated in column 4, lines 21-23, structure 10 is a *transfer* unit, which merely *transfers* combustion gases to the motor unit 11.

With regard to assertion iii, Thill indicates that the pressure of the primary exhaust products driving the "air motor" 10 is not substantially constant at steady state conditions as recited in claim 1 of the present application. Thill discloses the presence of pressure fluctuations at column 3, lines 3-7, and at column 5, lines 38-43. In column 4, lines 29-33, Thill teaches that

> [o]ne of the advantages of this engine is that the gas pressures in the combustion chamber, and in the conduits leading thereto and therefrom may rise to considerably higher pressure than the compressor output pressure…,
>
> preferably the supply conduit to the booster pump is connected to the combustion chamber inlet or inlet conduit, so that any fluctuations in pressure in the combustion chamber are communicated to the booster work chamber…,

and that this

> means that any pressure fluctuations in the combustion chamber 13 are communicated through pipe 15 and feed conduit 21 to the work chamber 904 of the booster pump 9.

With reference to Figure 4 of Thill, each time Thill's vane 802 passes interceptor 803, the higher gas pressures in the combustion chamber and in the conduits leading thereto and therefrom will be in direct communication with the considerably lower pressure air in the compressor and the conduits leading therefrom. One of ordinary skill in the art would conclude that at this point in each revolution a considerable backflow will occur, ensuring that the pressure driving the "air motor" 10 of Thill is not substantially constant at steady state conditions as recited in claim 1 of the present application. In contrast to Thill, the present application teaches the use of a check valve 417 as a backflow preventer.

With regard to assertion iv, it is respectfully submitted that Holtzapple does not teach a first reservoir as recited in the present claims, and it would be incongruous to combine the Holtzapple "reservoir" with Thill's disclosed engine. In contrast to Holtzapple, the first reservoir of the present invention communicates, in steady state, with each of the compressor and the combustor such that the compressor does not compress air any more than is required for operation of the engine. This is embodied in the language of claim 1, which states:

> the pressure in said chamber during the pressurization process and the pressure of the primary exhaust products driving said air motor are at a substantially constant level at steady state conditions and adjust spontaneously to the load being driven.

While Holtzapple discloses a pressure tank 214, paragraph [0126] of Holtzapple teaches that, during steady state operation "valve 212 is closed and valves 210 and 211 are open, allowing compressed air to go directly from the compressor 106 to the combustor 112", i.e. during steady state operation, the "pressure tank" is not in the circuit. Holtzapple actually teaches away from an engine with the unidirectional flow constraints of the present invention, since Holtzapple's pressure tank 214 is disclosed at column 11, lines 16-56 only in the context of regenerative braking and as a power source to start the engine; in fact, Holtzapple concludes:

> In another embodiment, pressure tank 214 is not provided, and an external power source is used to start the engine.

Therefore, it is respectfully submitted that structure 214 of Holtzapple is equivalent to the second reservoir, pressure tank 418, disclosed in the current application and is quite different in form, function and placement from the first reservoir 414A in the current application and as recited in the present claims (as noted above applicant's specification teaches that radiator 414 acts as a first reservoir).

Thill also teaches away from the claimed invention in column 3, lines 3-8, thereof:

> the supply conduit to the booster pump is connected to the

> combustion chamber inlet or inlet conduit, so that any fluctuations in pressure in the combustion chamber are communicated to the booster work chamber.

Therefore, Thill teaches directly away from the interposition of a reservoir (e.g., applicant's first reservoir), which would effectively isolate the booster work chamber from pressure fluctuations in the combustion chamber.

Attention is respectfully drawn to applicant's remarks of record that distinguish the present invention from Sauder, which include, *inter alia,* that the Sauder engine does not embody, and would not be modified by one of ordinary skill in the art to embody, an apparatus wherein the pressure in a compressor chamber during the pressurization process is at a substantially constant level at steady state conditions. Furthermore, on the matter of the reservoir, Sauder *emphasizes*, at column 8, lines 9-14, that the cylinders are segregated from one another *only* by virtue of the connecting pipes, thereby *teaching away from* the inclusion of a separate reservoir as claimed herein.

It is respectfully submitted that all of the claims currently pending in this application are allowable. If the Examiner has any further questions or concerns, Applicant respectfully requests an opportunity to meet with the Examiner to discuss how the present invention is patentable over from the prior art.

Respectfully submitted,

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/Daniel B. Schein/
Daniel B. Schein, Ph.D., Esq.
Registration No. 33,551

PO Box 68128
Virginia Beach, VA 23471
Telephone: (757) 965-5218
Facsimile: (757) 965-6775